of the University of London; chairman of the Brown Institution, with Burdon-Sanderson, Klein, Greenfield, Horsley, and their equally distinguished successors working as professors there; one of the most prominent Fellows of the College of Physicians, which was passing through a critical period of its history; and finally President of the General Council of Medical Education and Registration, of which he had been for thirty years a member—Quain had his hands full. Yet he never appeared to grudge his time to a friend in want of advice; and he was always keen and ready for the latest information in science. He had little time for ordinary literature. His nights were spent in writing—but in writing letters. It is true that he projected and edited the great Dictionary of Medicine with which his name is associated, and he wrote a few of the articles in it; but he produced—one might say "of course"—no book of his own. He had no patience for work of such a kind. Neither was he, nor could he have been, a teacher. He was much too quick in the workings of his mind to undertake instruction in laborious fashion.

Sir Richard Quain enjoyed the priceless privilege of the close personal friendship of many of the leading men of his time—Carlyle, Landseer, John Delane, Robert Lowe, and many others, particularly men belonging to the professions and the fine arts. He was a warm-hearted, generous friend, who never spared himself when he could be of service to others, particularly young workers at the medical sciences. His position was unique—won entirely by his ability and ceaseless energy—and cannot possibly be filled by another.

NOTES.

THE International Meteorological Conference which met in Paris in 1896 appointed a permanent Committee on terrestrial magnetism and atmospheric electricity, and submitted to the Committee a number of questions for report. In order that these questions may be well discussed, it has been decided to hold an international conference on terrestrial magnetism and atmospheric electricity in connection with the forthcoming meeting of the British Association at Bristol, which will begin on September 7. Letters of invitation are being sent out by the Committee; and all foreigners who propose to attend the conference may obtain tickets of membership of the British Association, free of charge, on application to the Assistant General Secretary of the Association. Among the subjects to be discussed are: the calculation of monthly means with and without taking disturbed days into account; the publication of the monthly means of the components X,Y,Z, and the differences ΔX, ΔY, ΔZ, of the monthly means from the preceding means; the establishment of temporary observatories, especially in tropical countries; and the relative advantages of long and short magnets. The decisions of the conference upon these questions will be reported direct to the International Meteorological Conference. But though the first business of the conference will be to report upon the questions submitted to them, papers and communications on other subjects connected with terrestrial magnetism and atmospheric electricity are also invited. It is desired that such papers be sent to the Committee some time before the opening of the British Association meeting.

A NUMBER of Fellows of the Royal Society have expressed a wish that a portrait of Lord Kelvin, who served as President from 1890 to 1895, should be placed in the apartments of the Royal Society, and a Committee is now being formed to carry out this object.

A BILL to amend the law with respect to vaccination was introduced in the House of Commons on Tuesday, and was read for the first time. The Bill provides that glycerinated calf lymph, the valuable properties of which were described in NATURE a few weeks ago (p. 391), shall be placed within the reach of all, and that no parents shall be required to submit their children for vaccination by means of anything but calf lymph. Vaccination will continue, as at present, to be obligatory; but vaccination by anything but calf lymph will cease to be compulsory. At present children must be vaccinated within three months after birth, but it is proposed to extend this period to twelve months.

IN the summer of 1897 a recommendation was made to the Government of India in support of the establishment of a physical laboratory in that country for advanced scientific teaching and research. The Government of India has now reported that the initial outlay on a physical laboratory of the kind described would be 60,000 tens of rupees, and that they are unable, in the present state of the finances, to entertain the scheme.

MAGDALEN COLLEGE, Oxford, announces that a Fellowship in Medical Science will be given by the College next October. From the terms of the announcement it appears that on this occasion the Fellowship will be bestowed merely for proficiency in the sciences related to medicine, as tested by examination; but that original work in these sciences will be fully recognised as a claim to distinction. The offering of this Fellowship affords new proof of the interest which Magdalen College—that has already done so much—still takes in the advancement of natural science.

WE regret to announce that Sir Henry Bessemer, F.R.S., the distinguished metallurgist and engineer, died on Tuesday evening.

THE eighth general meeting of the German Meteorological Society will be held at Frankfort-on-Main on April 14-16.

TOWARDS the end of the year 1896, at the request of a large number of distinguished men of science, philosophy and literature, Mr. Herbert Spencer agreed to have his portrait painted by Prof. Herkomer, for presentation to one of our national collections. The portrait is now finished, and will be sent to the next exhibition of the Royal Academy. In time it is intended to offer the picture to the Trustees of the National Portrait Gallery for hanging upon their walls.

WE learn from *Science* that the New York Zoological Society has secured the 100,000 dollars needed to enable it to take possession of the site provided by the city for a Zoological Garden. The total amount subscribed is 103,550 dollars, which included thirteen subscriptions of 5000 dollars each. According to the terms of the agreement between the Society and the city, as effected last year with the Commissioners of the Sinking Fund, the Society is under obligation to raise 250,000 dollars for buildings and collections, of which sum 100,000 dollars must be in the Society's treasury on or before the 24th of this month, and it was agreed that the Society could not take possession of the site until that amount had been provided.

AN Executive Committee of the Royal Zoological Society, Dublin, has made an appeal for subscriptions towards the erection of a "Haughton Memorial Building" in the gardens of the Society, in recognition of the important services rendered to the Society by the late Rev. Dr. Haughton, F.R.S., who for twenty-one years acted as its honorary secretary, and discharged the duties of president for five years. The form which the building will take has not yet been decided, but the Council of the Society propose that it should be one with a useful purpose. Subscriptions in support of this scheme for perpetuating Dr. Haughton's memory may be sent to Prof. D. J. Cunningham, Hon. Secretary, Royal Zoological Society, Dublin.

THE death is announced of Prof. Kirk, Fellow of the Linnean Society. Prof. Kirk (says the *Times*), who was of Scotch extraction, spent the greater part of a long life in the Colony of New Zealand. In connection with the Department of Woods and Forests he rendered valuable official service. He was a distinguished botanist, and his "Forest Flora of New Zealand" is the standard work upon the forest growths native to the islands. Since the production of his principal work he has continued, from time to time, to publish interesting monographs upon New Zealand timbers. A very valuable report on the trees suitable for forest cultivation in the Colony was issued by him in 1886, at which time he held the position of Conservator of State Forests in New Zealand; and he is understood to have been engaged up to the moment of his death upon a great work devoted to the botany of Australasia. Prof. Kirk was an eminent member of the New Zealand Institute, and his loss will be much deplored in scientific circles, both in England and Australasia.

WE regret to announce that Dr. Ferdinand Hurter, who had been in weak health for some time past, died suddenly at his residence near Liverpool last Saturday. Dr. Hurter was a native of Schaffhausen, in Switzerland, where he was born in 1844. He early turned his attention to chemistry and its practical applications, and after serving an apprenticeship to a dyer in Winterhun, he pursued the same science at Zürich Polytechnic, whence he proceeded to Heidelberg, where he took his Doctor's degree in 1866. In the following year he came to reside in England, and was appointed consulting chemist to Messrs. Gaskell and Deacon at Widnes. On the formation of the United Alkali Company, he occupied the same position of principal chemist to that firm. In addition to much work connected with his own profession, he will also be remembered for his investigations of photometric subjects, and particularly for a very thorough inquiry, which he made some years back in co-operation with Mr. Driffield, into the action of light on the photographic film. Some of the scientific results to which he was led in the cause of the inquiry have been questioned; but his work had great effect in improving the artistic character of photographic reproduction, by his discussion of the effects of varying the exposure, and his insistence on the truthful rendering of tone. Dr. Hurter was prominently connected with the local scientific societies, having occupied the position of President of both the Chemical and Physical Societies of Liverpool.

THE first number of the new volume of the *Rendiconti del Reale Istituto Lombardo* contains the conditions and particulars of the prizes offered for competition in 1898 and 1899. Most of these prizes are open to all nations; but the essays must be written in Italian, French, or Latin, and forwarded under a motto to the Secretary of the Istituto Lombardo, Palazzo di Brera, Milan. The prizes of general interest are the following: (1) The Institute's prize of 1200 lire for the most complete catalogue of extraordinary meteorological events from the most ancient times down to 1800, excluding auroras and earthquakes, which have already been catalogued. Last date, May 1, 1899. (2) The Cagnola prize of 2500 lire and a gold medal (value 500 lire) for a critical review of the theory of electric dissociation, with new experiments. Last date, April 30, 1898. (3) The Brambilla prize of 4000 lire to whoever shall have introduced into Lombardy the most useful new machinery or industrial process. Names to be sent in by April 30, 1898. (4) The Secco-Comneno prize of 864 lire for the best description of the Italian phosphate beds, and proposals concerning their exploitation. Last date, April 30, 1902. All essays must be accompanied by an envelope bearing the motto outside, and the name and address of the competitor inside.

A VERY valuable volume on the sanitary circumstances and administration of 220 urban districts of England and Wales has been issued as a supplement to the report of the medical officer in the twenty-fourth annual report of the Local Government Board (1894–95). The volume summarises the results of the general sanitary survey of urban districts organised by the late Dr. F. W. Barry, and carried out under his supervision during the period 1893–95. It contains the results of one of the most important pieces of administrative work ever undertaken by the Medical Department of the Local Government Board, and as a trustworthy statement of the sanitary conditions of urban districts is invaluable. The districts are arranged in alphabetical order, and under each is described the conditions of dwellings and their surroundings, water supply, sewerage and drainage, methods of excrement and refuse disposal and removal, and conditions and nature of supervision over registered premises and trades. The general character and efficiency of the administration of the sanitary authority of each district is described under a separate heading. The present report, with the one previously published on port and riparial districts, contains the results of the sanitary survey of 396 districts, the topographical positions of which are shown upon a map. It is to be regretted that a survey of such distinct value to public health could not be made to embrace the whole of England and Wales.

A PRACTICAL demonstration of Dr. Carl Linde's method of producing extreme cold and liquefying air was given in the rooms of the Society of Arts on Monday and Tuesday; and the apparatus employed is described by Prof. J. A. Ewing in the current number of the Society's *Journal* (March 11). The method, it may be remembered, is a regenerative one; that is to say, the cold produced by the treatment of one portion of air is communicated to the portion which is next coming on to be treated, with the result that the air undergoes continuous cooling, which is only limited by the leakage of heat into the apparatus from outside. In Dr. Linde's apparatus the step-down or drop in temperature is produced by letting compressed air escape through a small orifice from a region of high pressure to one of low pressure. As air is not a perfect gas, in the thermodynamic sense, it is slightly cooled by the expansion it undergoes, even though it does no work. The fall of temperature is little more than a quarter of a degree for each atmosphere of difference in pressure between the two sides of the orifice; but Dr. Linde has shown that this small amount is enough to furnish the step-down necessary in a regenerative process. The gas, cooled slightly by passing through the orifice, gives up its cold to gas which is approaching the orifice. The passage through the orifice cools that gas further, and so on, with the result that a cumulative cooling proceeds. A temperature of − 200° C., or lower, may thus be obtained without much difficulty. The machine exhibited at the Society of Arts circulated about 15 cubic metres per hour in a circuit in which the fall of pressure was from 200 atmospheres to 16 atmospheres. About 0·9 litres of liquid air was produced per hour, with a continuous expenditure of three horse-power. Dr. Linde is constructing a machine of 120 horse-power for the Rhenania Chemical Works at Aix-la-Chapelle, which is to be applied to the improvement of the Deacon process of chlorine manufacture. This machine is expected to produce 50 litres of liquid air per hour.

ATTENTION has recently been called, in two communications, to sources of error likely to arise in temperature determinations by means of thermometer readings. One of these has reference to the possibility of minute errors arising from expansion of the attached scale, when that form of thermometer is used. Opportunity for the determination of the amount of this error has offered itself at the Physikalisch-Technischen Reichsanstalt. Two pairs of thermometers, each pair being made of similar glass, and one pair divided on the stem, and the other on the scale, have been rigorously tested. The result is that the third place of decimals is not trustworthy if precautions have not been taken to remove the effects of the expansion of the scale. The other has reference to the accuracy of thermometric readings when the instrument is exposed in a medium whose temperature is rapidly changing. Dr. Hergesell, of Strassburg, in his investigation of the temperature of the air at considerable elevations, as derived from heat-registering apparatus carried in balloons, has been led to the conclusion that in order to ascertain the temperature of the air, it is necessary to take into account two corrections which can have a very important effect upon the result. One of these corrections, depending upon the velocity with which the registering apparatus is carried through the air, he has endeavoured to determine by actual experiment made in the Seewarte at Hamburg. The thermograph was mounted upon the whirling apparatus used for testing the anemometers, and driven with various degrees of velocity varying from zero to seven metres per second. The thermograph was warmed to about 30° C., and precautions taken to ensure uniformity in the distribution of the temperature. The arms were then rotated, and when the temperature of the thermograph had fallen to that of the testing-room, the resulting curves show the rate of cooling under the varying velocities.

THE second correction, which Dr. Hergesell calls the "inertia coefficient" in the paper referred to above, depending upon the variation of density of the surrounding medium, cannot be determined experimentally with the same ease. The author prefers to use the temperature recorded on the thermogram at equal, but considerable, altitudes on the ascending and descending journey. At an altitude above 4000 m. it may be assumed that the daily variation of temperature ceases, and therefore the difference of time at which the two readings are taken is immaterial. Dr. Hergesell makes use of the record of the balloon journey made February 18, 1897, from Paris. The temperature records in ascending and descending are arranged as functions of the atmospheric pressure, and show on the whole a tendency to regular deviation from each other. The greatest separation occurs at a pressure of 400 to 500 mm., while at 200 mm. the curves tend to become parallel. Dr. Hergesell assigns to the "inertia coefficient," which at the usual atmospheric pressure is unity, a value four times as great in a density corresponding to a pressure of 500 mm. In thermographs as at present arranged, the difference arising from these two sources of error, between the reading indicated and the true temperature, may amount to as much as 12°.

THE eleventh annual report of the Liverpool Marine Biology Committee has lately appeared, containing an account of the work done at the biological station at Port Erin during 1897. The year has been comparatively uneventful, but among the recent developments of the work of the station we notice a scheme for the simultaneous observation and record of surface organisms at different stations in the Irish Sea. Attention may be called to an obvious error on p. 13, in regard to the specific gravity of the sea-water in the tanks.

MR. H. L. CLARK has described the development of a viviparous Synapta which is abundant among algæ attached to mangrove roots in the West Indies. His observations induce him to support Ludwig's views concerning the degraded rank of the Synaptidæ in opposition to Semon's interpretations. In regard to the ancestry of Echinoderms as a whole, he again opposes Semon, and finds himself in close agreement with Bury; but, as the development of *Synapta vivipara* is direct and without metamorphosis, it is obvious that his criticisms of Semon's work cannot be regarded as final.

A RECENT number of the *Journal of the Society of Arts* contains an excellent review of the late outbreaks of plague in Bombay, by Mr. H. M. Birdwood. An account is given of the organised endeavours of the Government to combat the scourge, and some real idea of its extent may be gathered from the statement that up to the end of last year 56,000 deaths from plague had been reported for the whole Presidency, but that the actual number was probably not less than 70,000. Opinion appears to be unanimous that the utter disregard of the poorer natives for the commonest sanitary laws, and the horrible houses and "chawls" in which they principally live, are largely responsible factors for the firm hold which the disease has taken in the city of Bombay. The eminent authority, Dr. Cleghorn, who was deputed by the Government of India to study the position of affairs in Bombay, has vividly described the housing of the native population there. He tells us that the so-called chawls are mostly great buildings five to seven stories high on the flat principle, each flat containing a long corridor with rooms about 8 feet by 12 feet in size opening into it on either side; these rooms were usually inhabited by six to eight or even more persons, and the state of filth in these corridors, which are practically the receptacle for refuse from all the rooms, is indescribable. Each chawl contains from 500 to 1000 persons, and 70 per cent. of the native population are housed in this way. Dr. Cleghorn further goes on to say that such places were only to be seen in Bombay, and the marvel is not that so much plague abounded, but that it had not carried away at least half of the population. To cope with this terrible legacy of past generations of responsible authorities is no light task, but the Government are devoting their most earnest attention to carrying out a large and important scheme for the sanitary renovation of Bombay. It is discouraging in the highest degree to find that, despite all the heroic efforts which have been made to cope with the scourge, it has appeared with renewed strength, and an epidemic has been established for a second season in Bombay.

WE have received from the Director, Mr. N. A. F. Moos, the Report of the Bombay Magnetic and Meteorological Observatory for the year 1896. In addition to the general tables giving the readings of the self-recording magnetic and meteorological instruments, the report contains an account of the absolute measurements made during the year in order to standardise the self-recording instruments. In an appendix a short account is given of the disturbances produced on some of the self-recording instruments by the earthquake on June 12, 1897. Enlarged copies of the photographic trace of the disturbed instruments are included, which add considerably to the interest of the report. From the character of the disturbances the Director concludes that the disturbance of the magnetic instruments was not entirely of a mechanical nature, but that the earthquake did really produce a disturbance of the magnetic elements. The appendix also contains a discussion of fifty years' observations of declination made with one of Grubb's declinometers at the observatory.

THE United States Weather Bureau has published a discussion of the Floods of the Mississippi River, prepared by Mr. Park Morrill, the Forecast Official in charge of River and Flood Service. The paper refers to the chief characteristics of that river and of the basin that is drained by it, and contains valuable and trustworthy information as to the rainfall (which is the principal cause of the floods) and drainage under normal conditions, by means of a large number of tables and charts. These show that the difference in the amount of summer and winter rainfall is very great, the former being five or six times the latter in some districts. The floods occurring during the last twenty-six years, during which time trustworthy gauge readings are available, have been specially investigated; this period embraces six notable flood-years. The downfall of water in each of these has been computed, and the results are given in tabular form; the most destructive floods occurred in 1882, 1890 and 1897. In the latter year the river rose higher than was ever known below Cairo, but the duration of high water was exceeded in 1882 and 1884. One of the duties of the Weather Bureau is to issue warnings of impending floods, and it is satisfactory to note that ample notice is usually given. Indeed, so completely was the public warned on this last occasion that the Bureau was criticised for needlessly alarming the people in the threatened districts, but subsequent events fully justified its action.

FOLLOWING a recent example, the Royal Geographical Society has issued the first number of a "Year-Book and Record," designed to afford information respecting the constitution and working of the Society, and its annual progress. It seems somewhat strange that so useful a publication should not long ago have come into vogue; but we gladly welcome the newcomer as tending very considerably to enhance an interest in geography. Following the charter and bye-laws, an interesting account is given of the library and its contents, as well as of the map-room. Her Majesty's Government give 500*l.* per annum to the latter on condition that the public have access to the maps and charts. The illustrations are a pleasing feature, and give point and variety to the subject-matter. They comprise a view of the Society's house in Burlington Gardens, and selected parts of the interior, together with sundry plans; while very satisfactory reproductions are given of the two Royal medals and of the special medals which have been awarded from time to time for eminent services to geography. Some indication of size might well have been given here; if we mistake not, the gold Stanley medal was of quite heroic proportions—far larger than the illustration would make it appear. The list of recipients, beginning with Richard Lander, who received a Royal medal in 1832 for his discovery of the course of the River Niger, and the accompanying statement of the grounds of each award, is of distinct interest in this publication, connecting as it does the geographical progress of the past with the present. A long catalogue of pictures and busts is given. In another issue it would be useful, for reference, to supply painters' and sculptors' names.

HERR F. E. SUESS communicates to the *Verhandlungen* of the Austrian Geological Department some details of the earthquake at Graslitz between October 25 and November 7 of last year. It appears that the disturbance belonged to the group called "Vogtland-Erzgebirge" by Credner, and it is remarkable that at the end of the Graslitz earthquake the centre of disturbance seems to have moved to another locality as yet undetermined.

WE have received a paper by Prof. Dr. Eduard Richter, of Graz, containing an account of soundings and temperature observations made by the author in the lakes of Carinthia, Carniola, and Southern Tirol. The data discussed form the basis of the second part of the Atlas of the Austrian Lakes, produced under the joint editorship of the author and Prof. Penck, and published in the Vienna *Geographische Abhandlungen.*

THE *National Geographic Magazine* for January contains an article by Mr. Robert Stein, of the U.S. Geological Survey, on "Three Weeks in Hubbard Bay, West Greenland": the author, anxious to gain experience in Arctic work, was landed by Peary in his last expedition. Another paper, by Mr. W. J. McGee, deals with the "Modern Mississippi Problem," defined as being "not that of navigation, not even that of normal regimen as a great river, but that of the floods to which the stream is subject."

"THE Mechanics of Soil Moisture" forms the subject of a paper by Mr. Lyman J. Briggs, published by the United States Department of Agriculture. In it the author explains in simple terms such of the physical properties of liquids, including surface tension and viscosity, as are necessary to explain the retention and motion of water in the soil. To scientific students of agriculture, such an insight into the elementary laws of capillary phenomena will be useful in enabling them to explain the why and wherefore of the differences between heavy and light soils.

IN a *brochure* of six pages, on "Æther, its Nature and Place in the Universe," by Dr. Hugh Woods, published by the *Medical Magazine* Publishing Company, the author, after propounding his views on the existence of the ether and the why and wherefore of certain laws of nature, concludes by remarking: "The theory opens up far too wide a field for one man to traverse, however cursorily, especially when he can devote only a few leisure minutes to the difficult and laborious task." With this opinion we are certain that all who have read the paper will unanimously concur.

THE "Electrical Trades' Directory and Handbook," noticed in last week's NATURE, contains 1174 + clix pages in all, including the pages of advertisements. The extensive character of the electrical and allied industries may be gauged by the great size of the new volume of this Directory.

AN English edition of the two volumes of "Audubon and his Journals," the American edition of which was reviewed in NATURE of February 24 (pp. 386-7), has just been published by Mr. John C. Nimmo. Every field club and naturalists' society should add the volumes to their libraries, for they are full of interesting notes on outdoor natural history, and on the character and methods of a naturalist whose name is familiar to all observers of nature.

A SECOND edition of Prof. Heinrich Weber's systematic treatise on algebra, the "Lehrbuch der Algebra" (Brunswick: Vieweg und Sohn) is in course of publication, and the first volume of the new edition has just appeared. The scope and value of this masterly work has already been indicated in NATURE (vol. lv. pp. 25 and 481, November 12, and March 25, 1896). In the new edition the plan and method of the original work has been retained. About fifty pages of new matter have been added; corrections have been made where necessary, and paragraphs which appeared slightly obscure have been elucidated, while the section on the theory of elimination has been considerably enlarged.

AN ingenious actinograph, devised by Dr. Hurter and Mr. V. C. Driffield, has been sent to us by Messrs. Marion and Co. By means of a small double slide-rule, and a sliding set of curves movable at right angles to the motions of the rules, the variables concerned in photographic exposure are shown in their varying relations to one another. To find the time of exposure, the scales corresponding to the light, the lens, and the speed of the plate are set in their proper positions, and then the correct exposure can be read off. For photography under various conditions, such as views, portraiture, interiors, and copying, a table of factors are given. By using the actinograph intelligently a photographer may be confident of obtaining a good negative.

APPARATUS for simple experiments in physics, such as are described in manuals and text-books used in elementary physical laboratories, now take a prominent place in the catalogues o scientific instrument makers. A catalogue just received from Messrs. W. and J. George, Ltd., the successors to the late firm of Becker and Co., contains illustrations and prices of apparatus described in the volumes on practical physics by Schuster and Lee, Stewart and Gee, Watson, and Glazebrook. Similar catalogues have lately been published by Messrs. Griffin and Sons and Messrs. Philip Harris and Co. It is satisfactory to know that scientific instrument makers are beginning to understand the necessity of producing simple apparatus at a low price, now that students of physical science are expected to gain their knowledge by individual experience, even in the most elementary stages of the subject. What some of them have yet to learn, however, is that the apparatus is not intended as toys, but as a means of obtaining quantitative results; and unless this end is attainable, the instruments are of little value.

THE annual report for 1896-97 of the Director of the Field Columbian Museum, Chicago, is of interest to curators of museums, and records much progress. It is profusely illustrated by photographs of the rooms, and case-objects. In the division of economic botany, what is called a monographic installation of material exemplifying the North American forest trees is being pursued. The elements of the series comprise a branch, flowers, and fruit from the same tree, a photograph of the tree in summer, and in winter, a seven-foot length of trunk, and transverse section, a two-foot map, coloured to show the distribution of the species, and ornamental cabinet specimens. In the department of zoology the cases have been painted black inside. The report on the expedition and field work is of unusual interest. An account is given of the party which entered Somaliland under Mr. Elliot. He regards the collections made as very valuable, and probably the most important, especially as regards quadrupeds, ever brought out of any country by an expedition. Casts of heads and parts of bodies showing the muscles of the large animals were made, which will prove of the utmost service during mounting. Besides these, over 300 photographic negatives are in hand illustrating the scenery, the people, and also the animals, both living and dead. The last-named will be used in conjunction with the casts. It may be noted that the museum mostly does its own printing.

THE additions to the Zoological Society's Gardens during the past week include two Prairie Marmots (*Cynomys ludovicianus*) from North America, presented by Mr. J. Maurice Glyn; a Spotted Ichneumon (*Herpestes auropunctatus*) from Nepal, presented by the Rev. Sidney Vatcher; a Great Eagle Owl (*Bubo maximus*), European, presented by Captain Betram Goff; two Indian Chevrotaints (*Tragulus meminna*, ♂ ♂) from India, a Mantell's Apteryx (*Apteryx mantelli*), an Owen's Apteryx (*Apteryx oweni*) from New Zealand, two Cardinal Grosbeaks (*Cardinalis virginianus*) from North America, eight Undulated Grass Parrakeets (*Melopsittacus undulatus*) from Australia, a Brown Gannet (*Sula leucogastra*) from South America, a Black Lark (*Melanocorypha yeltoniensis*, ♂) from Siberia, four Chinese Quails (*Coturnix chinensis*) from China, a Black Woodpecker (*Picus martius*), a Solitary Thrush (*Monticola cyanus*), European, purchased; a Leopard (*Felis pardus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

CONSTANT OF ABERRATION.—Prof. C. L. Doolittle, from observations made at the Flower Observatory of the University of Pennsylvania, contributes a paper on this subject to the *Astr. Jour.* 428. He states "that in view of the present interest in the values of the astronomical constants, the investigation is published earlier than was intended. The result is preliminary in the sense that it is derived from a limited amount of material, which will ultimately be combined with other data." Küstner's method was employed, and he obtains a result of 20″·572 ± 0″·009, which is even larger than his recent deduction of 20″·55 from his South Bethlehem observation.

Since the adoption, then, of 20″·47 at the Paris Conference, the four most recent deductions all give higher values, viz. 20″·55 (Doolittle), 20″·533 (Fergola), 20″·57 (Finlay), and 20·572 (Doolittle).

WINNECKE'S COMET (α 1898).—This comet will make its perihelion passage in a few days—March 20. In *Astr. Nach.*, No. 3480, Dr. Hillebrand publishes a continuation of the ephemeris, which shows that the comet is on the borders of Aquarius and Capricornus, having passed between α and β Capricorni some few days ago. It is moving slowly in an easterly direction, but is badly placed for observation; so that it is unlikely to be seen again in ordinary telescopes until its next return in 1904.

NEW VARIABLE STARS.—We learn from the *Astronomical Journal*, No. 428, that the variability of the star S.D.M. −20°·2007, announced by Mr. Perry in No. 398 of that *Journal*, has been confirmed by Mr. Parkhurst, and in consequence the definite notation 2689 Z Puppis has been assigned to it.

The star in Gemini, announced as variable by Mr. Anderson in *Astr. Nach.* 3463, has also been confirmed by Mr. Parkhurst, and accordingly it has been called 2404 X Geminorum.

ASTRONOMICAL SERIALS.—The *Berliner Astronomisches Jahrbuch* for 1900 has recently been issued, under the editorship, as before, of Prof. Bauschinger, Director of the Rechen-Institut at Berlin. It contains particulars of the solar eclipse which will occur on May 28 of that year, and will be visible as total in the States of Georgia and South Carolina. Leaving North America the shadow band crosses the Atlantic, and strikes Europe on the coast of Portugal near Oporto, passing over Spain and Algeria.

The *Jahrbuch* contains the elements of all the small planets up to No. 425, which was discovered December 28, 1896, by M. Charlois; also opposition elements of a selected number.

The data and arrangement are the same generally as in previous years, but some important changes are contemplated in the planetary table for future years.

In the *Bulletin de la Société Astronomique* for this month there are several reproductions of the partial eclipse of the moon which took place on January 7. The photographs illustrating the various phases were taken by MM. Quénisset and Touchet; one at maximum is from a negative taken by M. Rudaux.

In the same *Journal* there is a summary of Prof. Schiaparelli's fifth "Memoir on Mars," containing his observations made during the opposition in 1886. The author has not given a general chart of the planet for this year, but his observations of 1886 happily complete our aerographical knowledge, by a rigorous examination of the north-polar region. A fine chart illustrating this region accompanies the paper, together with various aspects of the planet on different dates.

Five instantaneous photographs of Jupiter are also reproduced from photographs taken by Prof. Barnard at the Lick Observatory with the 36-inch telescope.

THE SPITSBERGEN GLACIERS.

ON Monday last Sir W. Martin Conway delivered a lecture before the Royal Geographical Society, in which he described the principal results of his second expedition to Spitsbergen, undertaken in conjunction with Mr. E. J. Garwood, in July and August 1897. It will be remembered that in the previous summer Sir Martin Conway, with several companions, for the first time explored, with any thoroughness, certain parts of the interior of the main island of Spitsbergen, throwing much new light on the physical features of the island and their mode of origin. In that year the principal attention was directed to the country south of Ice Fiord, between it and Bell Sound, the result being to show that this region was by no means the ice-clad country it had previously been considered. The principal object of last year's expedition was to examine a new section of the interior, north of Ice Fiord, which was still believed by some to be covered with an ice-sheet similar to that found in Greenland. Two districts in particular were chosen as the field of operations, the one (named by the lecturer Garwood Land) occupying the area between the extremities of Wijde Bay and Ice Fiord in the west and the sea in the east; the other lying west of the line joining the heads